THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A transmission including:

an input means;

an output means;

a plurality of secondary members for supplying output power for only part of each rotary cycle of the input means;

power transfer means for engagement with the plurality of secondary members;

the plurality of secondary members being coupled to one of the input means or the output means and the power transfer means being coupled to the other of the input means or the output means;

first orbital means for causing the plurality of secondary members to undergo orbital motion; and

second orbital means for causing the power transfer means to undergo orbital motion so the combined orbital motions cause power to be transmitted from the input power supply to the output power supply.

2. The transmission of claim 1, wherein the transmission further includes load distributing means for differentially distributing the load taken by the secondary members between at least two of the secondary members at any one time.

3. The transmission of claim 1, wherein the transmission includes phase changing means for changing the phase relationship of the orbital motions to, in turn, change the drive ratio of the transmissions.

4. The transmission of claim 1, wherein the orbital motion is a stationary orbital motion but in other embodiments the orbital motion could be either a progressive or a regressive orbital motion.

45. The transmission of claim 1, wherein the secondary members comprise a first set of pawls and a second set of pawls.

Sub a5 6. The transmission of claim 2, wherein the first orbit means comprises a pawl carriage for carrying the first and second sets of pawls, the pawl carriage having an epicyclic plate, an orbital control plate adjacent the epicyclic plate and orbit control means between the orbital control plate and the epicyclic plate.

B 6 7. The transmission of claim 5, wherein the orbital control means comprises a hole or recess on one of the orbital control plate or epicyclic plate and pins for engaging the hole or recess on the other of the orbital control plate or epicyclic plate.

7 8. The transmission of claim 5, wherein the power transfer means comprises a first assembler ring for engaging with the first set of pawls and a second assembler ring for engaging with the second set of pawls.

8 9. The transmission of claim 7, wherein the first and second assembler rings have ratchet teeth on an inner peripheral surface and the pawls carry shoes which in turn have ratchet teeth for engaging with the ratchet teeth on the first and second assembler rings.

9 10. The transmission of claim 5, wherein the pawl carriage has an axial portion and the pawls are pivotally coupled to the axial portion of the carriage ring.

Sub a6 11. The transmission of claim 1, wherein the second orbit means comprises an orbit body for carrying the first and second assembly rings, the orbit body having an epicyclic plate, an orbital control plate adjacent the epicyclic plate and orbit control means between the orbital

control plate and the epicyclic plate.

11 12. The transmission of claim 10, wherein the orbit control means comprises a hole or recess on one of the orbital control plate or epicyclic plate and pins for engaging the hole or recess on the other of the orbital control plate or epicyclic plate.

12 13. The transmission of claim 1, wherein the input means comprises a first input shaft having an eccentric upon which a pawl carriage is mounted and a second input shaft having an eccentric upon which orbit body is mounted.

13 14. The transmission of claim 12, wherein the input means also includes phase control means for controlling the phase relationship between the first and second input shafts and therefore between the first and second eccentrics to in turn control the phase relationship between the first and second eccentrics and therefore the phase relationship between the orbital motions.

14 15. The transmission of claim 7, wherein the differential load distribution means comprises differential load distribution gears arranged between the first and second assembler rings so that load can be transmitted from the first assembler ring to the second assembler ring and vice verse to thereby differentially distribute load between one of the first set of pawls and one of the second set of pawls at any one time.

15 16. The transmission of claim 8, wherein the engagement shoes are guided in a guide ring arranged between the first and second assembler rings.

16 17. The transmission of claim 15, wherein the engagement shoes have guide flanges which are received in

grooves in the guide ring to thereby guide movement of the engagement shoes relative to the guide ring and the first and second assembler rings.

17 ~~18~~. The transmission of claim ~~13~~ 14, wherein the differential load distribution gears are mounted on the guide ring and engage bevel teeth on side surfaces of the first and second assembler rings.

18 ~~19~~. The transmission of claim ~~6~~ 5, wherein positive engagement means is provided for moving the pawls into a position where the two orbits are able to positively cause engagement between the pawls and the assembler rings for any given phase relationship between the orbits.

19 ~~20~~. The transmission of claim ~~19~~ 18, wherein the assembler rings are mounted on the first eccentric and the pawls are arranged radially outwardly of the assembler rings for engagement with the assembler rings.

20 ~~21~~. The transmission of claim ~~19~~ 18, wherein the positive engagement means comprises arm members on the pawls and a control body for axial movement relative to the pawls, the control body having wedge-shaped recesses for receiving the arms so that upon axial movement of the control body, the wedge-shaped recesses contact the arms to move the pawl bodies radially to thereby cause positive engagement of the pawls with the assembler rings.

21 ~~22~~. The transmission of claim ~~21~~ 20, wherein the pawls are supported by the orbit body and the orbit body is provided with openings for receiving the pawls.

22 ~~23~~. The transmission of claim ~~22~~ 21, wherein control means is provided for axially moving the control body to engage and disengage the pawls with respect to the assembler rings.

23 ~~24~~. The transmission of claim 1, wherein the first orbital means includes a first eccentric and orbit control means for controlling the orbital motion and the second orbital means comprises a plurality of axles from which is mounted the power transfer means, the axles having eccentrics and being rotatable to provide controlled orbital motion to cause the power transfer means to undergo orbital motion.

24 ~~25~~. The transmission of claim 23 ~~24~~, wherein the power transfer means are supported by an orbital body mounted on the axles.

Sub A7 26. (amended) A transmission mechanism including:

an input power supply for supplying input rotary power;

an output power supply for providing rotary output power;

a plurality of secondary members arranged between the input power supply means and the output power supply means for transmitting power from the input power supply means to the output power supply means, the plurality of secondary members comprising at least a first array, including at least one secondary member, between the input power supply and the output power supply, and a second array including at least one further secondary member between the input power supply and the output power supply, the first and second arrays being in parallel with respect to one another;

a first assembler means for engagement with the first array of secondary members;

a second assembler means for engagement with the second array of further secondary members;

the secondary members of the first array and the secondary members of the second array transmitting drive to the respective first and second assembler rings through

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only part of each rotary cycle of the transmission mechanism; and

a load distributing gear engaged between the first and second assembler means for differentially distributing the load taken by the secondary members between the said at least one secondary member of the first array and the at least one further secondary member of the secondary array.

~~26~~ 25. (amended) The transmission of claim ~~26~~, wherein the first and second assembler means are gear rings having gear teeth on radially extending side surface thereof for engagement with the load distribution gear.

~~27~~ 26. (amended) The transmission of claim ~~27~~, wherein the secondary members are arranged radially inwardly of the first and second assembler rings and ratchet gear teeth are provided on an inner peripheral circumference of the first and second assembler rings for engagement with the respective first array of secondary members and second array of secondary members.

~~28~~ 26. (amended) The transmission of claim ~~27~~, wherein the first and second assembler rings are arranged radially inwardly of the secondary members and ratchet gear teeth are provided on an outer circumferential surface of the first and second assembler rings for engagement respectively with the first array of secondary members and second array of secondary members.

~~29~~ ~~30~~ 25. The transmission of claim ~~26~~, wherein the transmission mechanism includes:

a second plurality of secondary members for supplying output power for only part of each rotary cycle of the input ~~means~~ power supply;

a second transfer means for engagement with the plurality of secondary members;

the second plurality of secondary members being coupled with the plurality of secondary members for movement with the plurality of secondary members and the second transfer means being integral with or coupled to the power transfer means; and

the plurality of secondary members and power transfer means engaging and providing drive during rotation in a first direction of the input ~~means~~ power supply and the second plurality of secondary members and second power transfer means engaging and providing drive during rotation in an opposite direction of the input ~~means~~ power supply.

31. The transmission of claim 30, wherein the first plurality of secondary means are constrained so as to only engage the transfer means in the region when the transfer means and secondary members are closest during orbital movement of the secondary members and transfer means.

32. The transmission of claim 30, wherein the double orbiting system produced by the first orbital means and second orbital means provides two drive phases, one on the closest approach side of the orbiting power transfer means to the orbiting plurality of secondary members to produce a primary orbit and one on the opposite side to produce a counter phase orbit.

~~33~~ 31. The transmission of claim ~~32~~, wherein the transmission includes means for switching off one of the phases of the transmission to enable drive to be transmitted in either direction so that as the second plurality of secondary members begins to transmit drive, there is no destructive interference from the plurality of secondary members as one engages the primary phase and the other engages the counter phase.

34. A transmission including:

an input means;

an output means;

a first plurality of secondary members for supplying output power for only part of each rotary cycle of the input means in a first direction;

a second plurality of secondary members for supplying output power for only part of each rotary cycle of the input means in a reverse direction opposite the first direction;

power transfer means for engagement with the first plurality of secondary members and the second plurality of secondary members;

first orbit control means for causing the first and second plurality of secondary members to undergo orbital motion;

second orbital control means for causing the power transfer means to undergo orbital motion so the combined orbital motion causes power to be transmitted from the input power supply to the output power supply; and

means for selectively allowing supply of power between the first plurality of secondary members and the power transfer means in the first direction and supply of power between the second plurality of secondary members and the power transfer means in the reverse opposite direction so the transmission can selectively supply power in the first direction or the opposite reverse direction.

35. The transmission of claim 34, wherein the direction control means comprises a switch having an activation point and a first engagement tooth and a second engagement tooth, the switch being pivotally mounted to the first orbital means;

the first and second plurality of secondary members including first and second respective carriers, the first and second respective carriers having teeth for engagement selectively with the first or second tooth of the switch; and

upon rotation of the input means in the first

direction, the teeth of the carriage carrying the first plurality of secondary members engage the activation point of the switch to pivot the switch to cause the first tooth to engage with the teeth of the carriage so as to lock the first carriage to the first orbit control means; and

upon rotation of the input means in the reverse opposite direction the teeth of the second carriage engage the activation point to pivot the switch to cause the second tooth to engage with the teeth of the second carriage to lock the second carriage to the first orbital means.

35 ~~36~~. The transmission of claim 33 ~~34~~, wherein the first orbital means comprises a orbit control cylinder coupled with the output means.

36 ~~37~~. The transmission of claim 35 ~~36~~, wherein the orbit control cylinder is mounted on a first eccentric which in turn is mounted on the input shaft.

37 ~~38~~. The transmission of claim 33 ~~34~~, wherein the plurality of first secondary members comprises two sets of pawls.

38 ~~39~~. The transmission of claim 33 ~~34~~, wherein the second plurality of secondary members comprises two sets of pawls.

39 ~~40~~. The transmission of claim 33 ~~34~~, wherein the power transfer means comprises first and second pairs of assembler rings, each pair of assembler rings having a differential load distribution gear arranged therebetween for differentially distributing load between a pawl in the first set of pawls and the second set of pawls of each of the first plurality of secondary members and second plurality of secondary members.

40 ~~41~~. The transmission of claim 39 ~~40~~, wherein the second

orbit means comprises an orbit body carrying the first and second assembler rings.

42. The transmission of claim 41, wherein the differential load distribution gears are coupled to the orbit body.